DOCUMENT RESUME

ED 290 263 EC 201 725

AUTHOR Harmon, Marguerite; Frantz, Matthew
TITLE Computer Use as a Tool in Vocational Preparation and Adult Basic Educational Curriculums.
PUB DATE Oct 86
NOTE 21p.; In: Murphy, Harry J., Ed.; Computer Technology/Special Education/Rehabilitation: Proceedings of the Conference (Northridge, CA, October 16-18, 1986); see EC 201 720.
PUB TYPE Speeches/Conference Papers (150) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adult Basic Education; Adults; *Computer Literacy; *Computers; *Deafness; Employment; *Hearing Impairments; *Job Skills

ABSTRACT

A 3-year project has helped deaf workers and students acquire basic computer operating skills. Local labor market aspects were assessed through an Index Rating System with 113 different employers and 279 job profiles. Research was conducted regarding academic achievement for the hearing impaired and adult basic education population. Specific curriculum components for the career awareness and computer literacy areas are described. The adult basic education program is also briefly reviewed. Evaluation data are summarized, and implications noted, including the prevalence of unrealistic educational expectations by employers. (CL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED290263

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Computer Use As A Tool In Vocational Preparation And Adult Basic Educational Curriculums

Marguerite Harmon and Matthew Frantz
Community Outreach Program For The Deaf
Tucson, Arizona

EC201725

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Harry Murphy
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Abstract

A research and demonstration project involving deaf and hearing impaired persons is completing the final year of a three year process of examining the effects of computer literacy training and basic education on subsequent success in achieving vocational goals. The subject population has been divided into two groups: Workers in transition (operationally defined as persons in the labor force) and students in transition (operationally defined as persons participating in academic programs). Methods which were developed to assist deaf persons in acquiring basic computer operating skills, vocational information and basic education are discussed. These methods include: Indexing of Occupations, Vocational and Educational Screening, Activities Book Outline, Specialized Computer Software and Adapted Computer Software. Each method is described in the context of Adult Basic Education and how the method contributed to achievement of "real world" outcomes.

Project Background

Deaf persons are inadequately prepared to compete in nonservice occupational areas in part due to the pervasive use of computers in these areas and the concomitant lack of preparation of deaf persons in the use of computers in the workplace. Technology in the workplace includes fields which are "high tech" by nature; electronics and such; as well as more common trade and clerical areas such as secretary or auto mechanic. The common denominator is the use of the computer as a tool with the ability to complete the assigned task being predicated upon skill in the use of the computer.

In order to establish the hypotheses which arise from the stated problem some assumptions concerning the employment status, vocational preparation and educational achievement of deaf persons and the employment "market" in the community were made. These assumptions include:

1. The computer has an impact upon employment in various occupational areas for deaf persons to a greater or lesser degree dependent upon the following:
   a. the relevance of that occupation in the employment of the deaf and hearing impaired,
   b. the relevance of the employment growth in that occupation and,
   c. the impact the computer has on the method of performing the job task.
2. The impact of the computer upon occupational areas will vary by degree and can be rated accordingly.
3. The identified limitations of individual deaf and hearing impaired persons can be overcome through an intervention strategy which relates the demands of the computer as a tool to the performance of a specific job and the "deficits of the individual".

This requirement to test assumptions about the impact of computer technology on occupations across industries resulted in the need to develop an indexing of occupations. This index was to be the basis of an interactive model between three "real world" factors and the research/service environment.

The Adult Basic Education program which was developed was an attempt to respond to the interaction of the demands of the local labor market (e.g., use of computers, skills required, education required, etc.) the needs of the deaf (e.g. physical accommodation, academic remediation, etc.) and the anticipated/actual vocational outcome.

This model was the basis for overall program development as well as the criteria upon which individual programs for participants were based. Inclusion in the service delivery process was then based upon commonality of reliance in all three areas, and would be omitted if the activity could not pass this relevance "test".

See Figure 1 (next page)

The first phase of this model was the assessment of local labor market. This was accomplished through an Index Rating System. This system included information based upon individual employer interviews.

Figures 2 and 3 represent the indexing system. The IRF (Index Rating Form) is the raw data collection instrument and the distribution chart represents how the Tucson industry fared in computer use and applicability. The labor market survey system includes a number of employer contact and questionnaire forms. These range in content from standard job analysis concerns to more employer specific information such as current and projected computer use per occupation, growth forecasts and relevance for employment of the deaf. This system established an ongoing database for all labor market/occupational information for the project.

LABOR
MARKET
DEMANDS
CLIENT
NEEDS
SERVICES
VOCATIONAL OUTCOMES

Figure 1

IRF

Employer (from C/E)	Industry Designation	Occupation Area	Occupation Name	Academic Level Required	Computer Usage(1-6)	Applica-bility	Index Rating

NOTES

1. Industry designation from industry chart.
2. Occupation area from page 4 of FP.
3. Computer usage - implementation plans:

   1 - minimal - slow
   2 - minimal - moderate
   3 - moderate - slow
   4 - moderate - moderate
   5 - much - slow
   6 - much - moderate

4. Meets 3 of 3 criteria - A
   2 of 3 - B
   1 of 3 - C
5. Index rating: CU + A = IR

Figure 2

DISTRIBUTION CHART

COMPUTER IMPACT

APPLICABILITY	1	2	3	4	5	6
A						
B						
C						

NOTES

1. Indicates distribution across impact and between relevance catagories.
2. Determine distribution.
3. Tally index rating from IRF.
4. Computer usage - implementation plans:
   - 1 - minimal - slow
   - 2 - minimal - moderate
   - 3 - moderate - slow
   - 4 - moderate - moderate
   - 5 - much - slow
   - 6 - much - moderate
5. Meets 3 of 3 criteria - A
   2 of 3 - B
   1 of 3 - C

Figure 3

With 113 different employers and 279 job profiles, the following assumptions can be inferred:

1. Most employers base educational requirements upon the educational level of the person currently occupying the position. Without exception a high school diploma is assumed.
2. Transition to use of computers in most occupations has been slower than employers projected three years ago.
3. 31% of employers interviewed assume a deaf person cannot perform the functions of their jobs.

For the purposes of this paper, Finding Number One is most important with findings Two and Three having relevance to overall project implications.

Simultaneously with the the Index Rating System being developed, research related to academic achievement for the hearing impaired population and adult basic education was conducted. Generally, adolescents and adults do not perform as well as hearing peers on standardized achievement tests. The Office of Demographic Studies (ODS) at Gallaudet College found in their annual survey of hearing impaired children and youth that only 12% of hearing impaired students graduating from high school programs could read above an 8th grade level (1976). Previous studies using various reading assessments, all reported minimal reading improvement in hearing impaired children from the ages 11 through 18 (Pugh 1946, Goetzinger and Rousey 1959, Aronow and Moskowitz 1963, Furth 1966 and Balow, Fulton and Peploe 1971). For most hearing impaired students, the mean reading level was between the third and fourth grade upon graduation. Recent

reports have continued to support these findings. Research by the Office of Demographic Studies found that reading levels on the Standard Achievement Test for the Hearing Impaired plateau between the third and fourth grade level at age 15. In most recent research, the Adult Continuing Education at Gallaudet (1986) reported that the top 1/3 percentile of preparatory students entering Gallaudet College had a mean reading level of 5.2.

Vocabulary and mathematic scores for hearing impaired students were also below hearing peers using standardized achievement tests. The Office of Demographic Studies (1977) reported the average score of a 9 year old hearing impaired child on the vocabulary section of the SAT-HI to be K.1 while the average score for 18 year olds was 2.0. This represented less than 2 years difference between 9 and 18 year old students and an average of 10 years retardation in a 19 year olds' vocabulary development.

Mathematic scores on the SAT-HI tend to level out at the 7th grade for hearing impaired students beginning at age 15. Twenty-five percent of hearing impaired students over 18 can do math beyond the 9th grade.

Research conducted regarding the characteristics of participants in adult basic education (ABE) found that the largest group of individuals served by ABE were between the ages of 20 and 55. About one-third of these participants had completed up to twelve years of schooling (Adler 1984). In assessing the instructional functioning of adult basic education programs, Adler stated that career development was an essential part of adult basic education. Individuals enrolled in ABE programs were described as having specific career

development needs related to deficiencies in basic skills, unsatisfying or no vocational experiences, and possible low self-esteem. Research related to career development and hearing impaired adults concluded that few hearing impaired workers had access to extensive and appropriate information, counseling, and guidance in making career choices. Few resources were available to assist in upgrading the skills of unemployed, underemployed, displaced or otherwise terminated hearing impaired workers (Watson, Anderson, Marut, Ouellette, and Ford 1983). A survey of continuing education for deaf consumers in 15 cities, reported that deaf adults had similar needs for continuing education as the hearing population. Deaf consumers ranked improvement of language skills, better management of home, property and money, and increased income through better jobs as their top priorities (Costello, 1977).

Based on information obtained through the literature review, the Index Rating System, and meetings with employers, COPD designed its adult basic education program. The ABE program was operationally defined as a program of services to improve not only academic functioning of hearing impaired persons but also to increase work opportunities, ability to complete, maintain and upgrade work tasks, and provide information that will lead to the ability to further access training or educational options. The ABE program expected hearing impaired persons to have low academic skills in reading, mathematics, and vocabulary. As an agency providing career awareness and job placement, it was anticipated that persons entering the program would have specific career goals. In addition a project goal was to introduce the computer as a tool to present vocational information.

Therefore, the ABE program developed its curriculum to address all of these areas and meet the needs of hearing impaired persons.

The discussion to this point indicates the following hypotheses:

1. A service delivery model which replicates the use of the computer in the workplace will increase participant employability and improve career choice.
2. An instructional model which incorporates the computer as a tool for providing career and computer information will improve acquisition of computer literacy skills.
3. An Adult Basic Education model which will be based upon vocational functioning will improve the acquisition of basic literacy skills.

The project participants were divided into two groups: workers in transition; operationally defined as persons in the labor market and students in transition; operationally defined as persons participating in academic programs.

Although the focus of this paper is the Worker in Transition Group in general, the combined population is composed of 123 persons between the ages of 14 and 66. These persons were predominantly profoundly deaf and used sign language to communicate. For Workers in Transition group, the tested mean academic achievement grade level in reading was 3.6, vocabulary was 3.8, and mathematics was 5.3 Regarding the educational status of this group, 90% of the participants had a high school diploma.

Program Process

As has been mentioned, the project attempted to address several different population needs through an individualized service program.

Before discussing the ABE portion in depth, an overview of the project and materials will be presented.

The initial phase of the project was referral and assessment. In an effort to have a better understanding of each participant, the Prevocational Screening was administered to all prospective persons. The areas reviewed were Job Awareness, Interests, Needs, Work Habits, Daily Living Skills, and Skills and Abilities. This was not meant to be a comprehensive vocational evaluation. The VALPAR Micro-Computer Evaluation and Screening Assessment (MESA) was the primary diagnostic tool. This was coupled with the participant interview, worker rating assessment and job profile.

A specific curriculum for the career awareness and computer literacy (CACL) component of the program was developed. The instructional instrument used for this component was the ACTIVITIES BOOK OUTLINE (ABO). This instrument was used to provide a structured approach to teaching both computer literacy and career exploration in a hands-on fashion.

As the educational programs were implemented, specific instruments were developed and purchased to assist with instructional services within the CACL program. Two instruments, the Index Rating System and the Activities Book Outline, have already been mentioned. The following group of additional instruments listed represents both agency developed systems and modified hardware/software systems: Name That Industry, Name My Occupation and ValSearch Job Bank.

Each CACL model was used with both students in transition (SITS) and the workers in transition (WITS) participants, a total of 79 persons. Each WIT participant in CACL received a 15 week program.

In conjunction with the local community college, CACL was offered as a three credit course and participants were allowed to use the computer lab. Within the program were options for introduction to the computer in technical, clerical, machine and general industrial areas. Participants completed modules such as formatting disks, using a word processor, developing spreadsheets, and exploring career and local labor market information. Certain modules were required for all participants. As they progressed in the course, participants focused on computer exercises related to their career goal.

In the final class posttesting of all participants was completed. A total of 32 persons participated in a three semester time frame with 23 completing all requirements. Posttest results specific to the participant population showed an average increase in test scores of 10 points. Group results on the posttest indicated a 100% increase in the mean score. T-Test for significance of the difference between means on the pre/post test was at the .01 level. The significant innovation of this method was that participants simultaneously gained computer operating skills, local job market data and how this information impacts on their personal career goals. As participants completed the CACL training, each person had an exit interview to discuss how to use the information learned either on the job or to assist with obtaining a job. The Adult Education program, in keeping with the interactive model of services proposed, was based upon labor market environment information from the Index Rating System, individual needs and analysis of specific skills related to work tasks.

ABE Curriculum

As participants entered the ABE program, evaluation data was reviewed to effectively develop an educational plan to address the vocational and educational needs of each person. This information was used to determine appropriate placement in the ABE curriculum.

The curriculum implemented in the ABE program used a multi-modal approach. The prescribed content areas of the curriculum were reading, mathematics, language/writing, and study skills. The organizing elements for the curriculum were vocational needs, academic survival needs and individual interests. These categories represent the primary concern areas for all participants. All materials and procedures were dependent upon these elements. Services were provided in a format that was congruent with a person's hearing loss, mode of communication/language and cultural value system.

In addition to CACL materials, other career software programs were implemented in learning situations. In planning computer activities, the ABE program used an authoring system to design academic and vocational exercises related to a person's specific needs. The authoring system allowed the instructor to develop computerized lessons and be able to control language structures, vocabulary terms and reading levels. Participants were also involved in using the authoring systems to develop lessons and activities for other ABE participants. Several purchased software programs were incorporated into the curriculum. Software programs were used for drill, as tutorial devices and as recreational entertainment.

In conjunction with the computer, text materials, videotapes, materials from employers, simulated work experiences and guests

speakers were instructional tools used in the ABE program. Participants were encouraged to bring books, magazines and work related information to class so that specific materials could be incorporated into each person's educational program.

Several evaluation techniques were used in the ABE program. For remedial academic exercises, traditional tests and handouts were used to evaluate participant's progress. Directly related to career areas, activities and evaluation were based on real work behaviors. For example, a person in ABE who was employed completed writing exercises with the assistance of co-workers, completed work evaluations on their own job performance, and presented career information about their occupations to participants seeking employment. Evaluation and feedback on these activities were provided by the ABE instructor, job supervisors and co-workers. At each six week interval, an overall evaluation was completed for all participants. Each person's educational plan was reviewed to assess progress and make any necessary changes.

In the three years of this project, the ABE program served 16 adults. Nine adults were able to participate in the program for a period of six months or longer. As part of the project goal, grade levels and improvement in academic areas were assessed. Academic test results for program participants were:

	Pre-Test Score	Post-test Score
Academic Area	Grade Level	Grade Level
Reading	6.9	8.2
Vocabulary	5.5	6.4
Spelling	5.4	5.7
Mathematics	4.7	6.0

that would accommodate the hearing impaired person on the job.

2. Localization of Labor Market and Career Information - The information from the Index Rating System and employer contacts helped to identify realistic expectations for hearing impaired persons. The data also assisted in identifying barriers that hearing impaired persons would encounter in the local job market.

3. Educational Improvement - The differences between project improvement in tested achievement and the expected outcome indicated by previous research can be attributed in part to the vocational specific content information and the value of individualized instruction.

References

Adler, E. Adult Basic Education: A Rehabilitation Resource, American Rehabilitation, (April 1984) Vol. X, No. 4.

Annual and Five Year Comprehensive Vocational Education County Plan for Pima and Santa Cruz Counties. Vocational Education Planning Task Force. July 25, 1983.

Bowe, F. "Employment Trends: 1984 and Beyond Where the Jobs Will Be". 1984

Computers for the Disabled. Conference Papers. 1984, pp. 3-7.

Costello, E. Continuing Education for Deaf Adults. American Annals of the Deaf, (February 1977) Vol. 122.

Croft, F. Unpublished Report, April 1986.

Education in Arizona. Arizona Labor Market Newsletter, (June 1984) Vol. VIII, No. 6.

Fennerson, D.A. High Tech/High Touch: Making Good on the Promise.

Jobs in High-Tech Industries. Arizona Labor Market Newsletter, (June 1983) Vol. VII, No. 6.

LaSasso, C. Annotated Bibliography, Gallaudet College 1981.

Posttest scores for academic areas indicated improvement of a grade level or higher for reading, vocabulary and mathematics. The average individual gain for each participant was seven-tenths of a grade level for reading and vocabulary, a tenth of a grade level for spelling and eight tenths of a grade level for mathematics. Of added importance were the real world outcomes associated with participants in the ABE program. Of the 16 participants in ABE, 11 were unemployed upon entering the program. Eight participants were able to secure employment during their education program. Six persons also enrolled in a post secondary program to further improve academic skills.

Summary

Both the computer awareness/computer literacy and the adult education program were successful in providing a needed service to the hearing impaired community of Tucson, Arizona. In order for other agencies to replicate services, the following implications need consideration:

1. Awareness of Employers - Specifically the unrealistic educational expectations and unrealistic attitudes toward the capabilities of hearing impaired persons. The Index Rating System and job profiles used in the program assisted in identifying the educational requirements for local jobs. In the majority of occupations the "twelfth grade" high school equivalent far exceeded the necessary educational level to complete the job tasks. Many employers considered hearing impaired persons a risk to their business due to the inability to hear alarms or complete certain job tasks. For the most part, employers were unaware of small adaptations

Moores, D. Educating the Deaf: Psychology, Principles, and Practices. 1978.

Watson, D. et al. Integrating Technology, Human Resources, and Systems to Enhance the Career Development of Deaf People. Arkansas Research and Training Center. 1983.